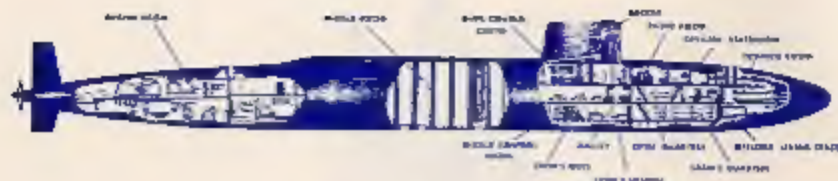




**USS GEORGE C. MARSHALL
(SSBN 654) (GOLD)**



NAVIGATION SYSTEM

Two positions must be known for success in missile launching — target and launcher. This places great importance on navigation since the position of the launcher is the position of the ship and is continuously changing. Several navigational methods complement each other in the FBM submarine to provide a very high order of accuracy in determining ship's position. At the heart of the system is the Ship's Inertial Navigation System (SINS) which integrates ship motion, speed, and headings to give a continuous report of ship's position. The ship has two SINS, each checking the other. Similar systems guided NAUTILUS and SKATE on their historic voyages beneath the polar ice in 1958, TRITON on her 84 day underwater cruise around the world, and more recently, SEA DRAGON and SKATE in their rendezvous at the North Pole in summer of 1962.

TRAINING

The average pre-commissioning training period of GEORGE C. MARSHALL personnel is about 18 months. From several weeks to a year is devoted to formal schooling in radio, sonar, navigation, fire control, weapons or engineering. After a thorough grounding in such items as transistors, electronic circuitry, Boolean logic, digital computer theory, hydraulics, and

nuclear physics, **GEORGE C. MARSHALL** Personnel receive intensive training in the maintenance of integrated systems. The training program continues at sea, and on shore off crews are provided with training facilities in the home port of the various SSBN Squadrons.

COMMUNICATIONS

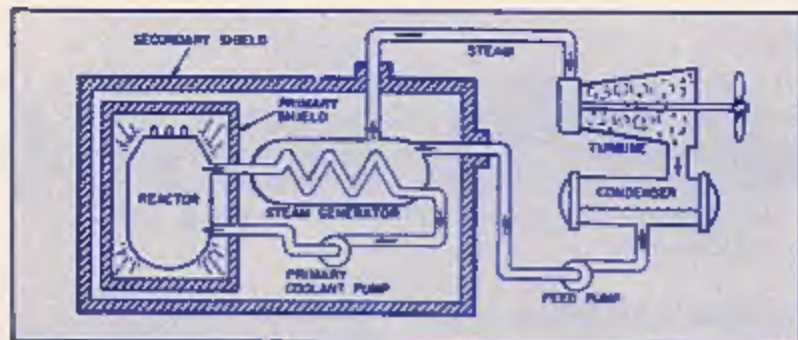
Radio communications with submerged submarines have been possible for a number of years. The systems used have been devised with special care to protect the locations of the submarines and leave the advantage of concealment unimpaired. Recent tests have again demonstrated that the Navy's worldwide communication system has the power and coverage necessary to exercise command of the always-submerged Fleet Ballistic Missile submarine.

SUPPLY

To support the intricate systems in **GEORGE C. MARSHALL** the Supply Department maintains a variety of spare parts which number about 95% of the range of different spares stocked aboard an aircraft carrier. The Supply Department also stores and prepares the variety and quality of food and baked goods normally found in a good hotel. All of these jobs are done with a handful of men and in very limited space.

FIRE CONTROL

The fire control system feeds a wealth of coordinated information to the missile guidance system. Ship location, local vertical, true north heading, target location and trajectory to be flown are continuously supplied until the very instant of firing.



THE POWER PLANT

GEORGE C. MARSHALL is powered by a nuclear power plant consisting of a nuclear reactor which provides heat for the generation of steam to drive the main propulsion turbines, for propulsion, and the ship's service turbo-generators for electric power. The primary system is a circulating water cycle and consists of the reactor, identical port and starboard loops of piping, primary coolant pumps and the tubes of the steam generators. Heat is produced in the reactor by nuclear fission and is transferred to the circulating primary coolant water which is pressurized to prevent boiling. This water is then pumped through the steam generator tubes where it transfers its heat to the shell or the secondary side of the steam generators and boils water to form steam. It is then pumped back to the reactor by the primary coolant pumps and reheated for the next cycle.

The secondary system is the steam producing cycle and is made up of the shell side of the steam generators, turbines, condensers, and steam generator feed pumps. It is completely isolated from the primary system since the primary water goes through the tubes of the steam generator while the water which is boiling to make steam is on the shell side of the steam generator. Steam rises from the steam generators, then flows to the engine room where it drives the ship's service turbogenerators which supply the ship with electricity and the main propulsion turbines which drive the propeller. After passing through the turbines, the steam is condensed and the water is fed back to the steam generators by the feed pumps. There is no step in the generation of this power which requires the presence of air or oxygen. This fact alone allows the ship to operate completely divorced from the earth's atmosphere for extended periods of time.

During the operation of the nuclear power plant high levels of radiation exist around the reactor and personnel are not permitted entrance into the reactor compartment until after the reactor is shut down. Heavy shielding is used to protect the crew so that the average crew member receives less radiation than he would receive from natural sources ashore.



THE FLEET BALLISTIC MISSILE SUBMARINE



The decade immediately following World War II saw a great change in the political power structure of the world. The United States changed its wartime role as "Arsenal of Democracy" to the "Bulwark of Freedom" in the cold war. To meet the challenge of the new role, new weapons systems were needed.

In January 1954, the USS NAUTILUS announced to the world that she was "underway on nuclear power." The vehicle for an advanced weapons system was complete. An undersea craft which is silent, fast, highly maneuverable, and capable of fighting a war the length of World War II without refueling was available.

USS GEORGE C. MARSHALL (SSBN 654)



GEORGE C. MARSHALL is the thirty-sixth Fleet Ballistic Missile Submarine and the fifty-eighth nuclear powered submarine to become an operating element of the United States' powerful nuclear deterrent force. With her sixteen missile tubes, she can launch the Navy's C-3, twenty-five hundred mile Poseidon missile either surfaced or submerged. She is capable of prolonged submerged operation undetected.

The ship is proudly named for General of the Army George Catlett Marshall. General Marshall can be identified with everything we hold sacred to the military tradition. A man of wisdom, modesty, persistence and infinite patience, General Marshall was largely responsible for the most magnificent war effort in American history. He was instrumental in welding our alliance with Great Britain into the most cooperative effort between two nations in the history of warfare. Continuing his service to this country as Secretary of State and later Secretary of Defense, his tenure of political office was marked by the most imaginative and comprehensive program of foreign aid yet conceived. The fruits of his work are readily evidenced by the prosperity most European countries enjoy today. We pray that this ship will always serve to preserve the peace which George C. Marshall labored to achieve.



Keel Laid: 2 March 1964

Launched: 21 May 1965

Sea Trials: 27 March 1966

Commissioned: 29 April 1966

Length: 425 feet

Beam: 33 feet

Maximum Depth: In excess of 400 feet

Maximum Speed: In excess of 20 knots

Submerged Displacement: 8,250 tons

Ship's Complement: 137 Officers and men each crew

Number of Missile Tubes: 16

Number of Torpedo Tubes: 4



COMMANDER EDWARD P. GRIFFING UNITED STATES NAVY

Commander Edward P. GRIFFING is a native of Palm Springs, California. He received his commission through the regular Naval Reserve Officer Training Program, graduating from Stanford University in 1955. He subsequently served on board the destroyer escort USS ALVIN C. COCKRELL (DE386), and the Staff of Commander Mine Squadron EIGHT in Charleston, South Carolina and as Navigator of the Guided Missile Frigate USS COONTZ (DLG9). Commander GRIFFING completed post graduate education in the advanced science program (Mathematics) at the U.S. Naval Postgraduate School, Monterey, California and then at Stanford University in 1962.

Commander GRIFFING was selected for submarine nuclear power training in 1964. He qualified in submarines on board the USS POLLACK (SSN603). Next assigned as Executive Officer of USS ANDREW JACKSON (SSBN619) (GOLD), Commander GRIFFING qualified for Command of Submarines and then moved twice with the ANDREW JACKSON through shipyard overhaul completing his three year tour in March 1970. Commander GRIFFING's first command was the USS SAM HOUSTON (SSBN609) (GOLD) which he departed in July of 1972.

Commander GRIFFING reported to the USS GEORGE C. MARSHALL (SSBN654) (GOLD) as she completed conversion at Puget Sound Naval Shipyard, Bremerton, Washington.

Commander GRIFFING led the USS GEORGE C. MARSHALL through her post overhaul shakedown period which included a transit from Bremerton, Washington through the Panama Canal, and an operational launch of a POSEIDON missile. Commander GRIFFING has also taken the USS GEORGE C. MARSHALL through two successful POSEIDON patrols.

Commander GRIFFING is married to the former Ayer HATCHER of Macon, Georgia. They have two daughters, Kathleen and Elizabeth.

Change of Command

15 OCTOBER 1974

SCHEDULE OF EVENTS

ARRIVAL OF OFFICIAL PARTY

Honors

NATIONAL ANTHEM

Northeastern Navy Band

INVOCATION

Rev. Gale R. Williamson,
Gales Ferry Methodist Church

CDR EDWARD PERRY GRIFFING, USN

Remarks and Reading of Orders

CDR JOHN STEPHEN ROBERTSON, USN

Reading of Orders and Relief of Command

RADM STEVEN ANGELO WHITE, USN

Commander Submarine Group TWO

Remarks

BENEDICTION

Rev. Gale R. Williamson
Gales Ferry Methodist Church

DEPARTURE OF OFFICIAL PARTY

Honors

THE CEREMONY



The change of command ceremony is a time-honored tradition which formally restates to the officers and personnel of the command the continuity of the authority of the command. It is a formal ritual conducted before the assembled company of the command. The change of command of a naval unit is nearly unique in the world today; it is a transfer of total responsibility, authority and accountability from one individual to another.



**COMMANDER JOHN S. ROBERTSON
UNITED STATES NAVY**

Commander John S. ROBERTSON is a native of Andover, Massachusetts and a 1959 graduate of the U. S. Naval Academy. Following commissioning he served aboard USS WILLIS A. LEE (DL 4) and on the commissioning crew of USS SEMMES (DDG 18).

In 1963 Commander ROBERTSON commenced Submarine School and Nuclear Power Training and reported to USS SAM HOUSTON (SSBN 609) in 1965. He served in various division officer billets through the HOUSTON's first overhaul, then reported to USS WILL ROGERS (SSBN 659) as Navigator.

In 1970 Commander ROBERTSON attended the Naval War College and concurrently the University of Rhode Island receiving a Masters Degree in Marine Affairs. He then served as Executive Officer of USS ETHAN ALLEN (SSBN 608) and USS TINOSA (SSN 606) through 1974.

Commander ROBERTSON is married to Marian Patricia Reardon of Newport, Rhode Island. They have two sons and reside in Gales Ferry, Connecticut.

SHIP'S HISTORY



In 1958 Congress authorized the construction of the Fleet Ballistic Missile Submarine. Now forty-one in number, these Polaris missile launching platforms were the result of extensive and imaginative development in such fields as environmental control, nuclear engineering, inertial navigation, and solid propellant rocketry.

USS GEORGE C. MARSHALL (SSBN 654) is the lead ship in the last and most highly sophisticated sub-class of Polaris submarines. She is so named, that we may remember a man whose leadership in both war and peace was in keeping with the highest traditions of our nation. In his lifetime he was not only Army Chief of Staff, Secretary of Defense, Ambassador to China, Secretary of State, architect of the European Recovery Plan (Marshall Plan) and President of the American Red Cross, but also the first military figure in history to receive the Nobel Prize. As a five-star general, he was still on active duty and the highest ranking officer of the Army at the time of his death in 1959.

On February 19, 1964 the keel was laid and construction commenced on Newport News Shipbuilding and Dry Dock Company's Hall 571. On May 19, 1965 this sleek 425 foot, 8250 ton submarine was christened GEORGE C. MARSHALL and slid down the builder's ways at the gentle command of her sponsor, Mrs. George C. Marshall. On this occasion, General Marshall's Alma Mater, Virginia Military Institute honored one of her most famous sons by sending a cadet color guard, and his old friend and successor as Secretary of State, Dean Acheson, was principal speaker.

During the fitting-out period following launching, primary consideration was accorded to matters of safety and reliability. Designed from the keel to conform to the SUBSAFE criteria established as a result of lessons learned from the tragic loss of USS THRESHOL in 1962, GEORGE

C. MARSHALL enjoys a freedom of movement in the seas shared by few others.

On January 25, 1966, the message was received, "Place GEORGE C. MARSHALL 'In Service'", and on March 27, 1966, word was radioed to Commander Submarine Force, U. S. Atlantic Fleet, "GEORGE C. MARSHALL diving" for the first time. This, the first of four builder's trials, was designated ALFA trial, and was the test of the propulsion systems. Vice Admiral H. G. Rickover, acting for the U. S. Atomic Energy Commission, and the U. S. Navy, was in charge of the trial. On April 29, 1966 the Navy accepted GEORGE C. MARSHALL in a commissioning ceremony at Newport News, Virginia, and Mrs. Marshall won everyone's heart when she exclaimed, "This is MY ship!"

In the months which followed, GEORGE C. MARSHALL proved her unexcelled ability to accomplish her primary mission by conducting two perfect submerged launch demonstrations, one by each crew, firing the A3 Polaris missile over 1,000 miles from a position just off Cape Kennedy. Commanding the BLUE Crew was Commander Warren R. Cobean, Jr., who had been the Commanding Officer of the Precommissioning Unit. Commanding the GOLD Crew was Commander Willard E. Johnson.

At last, two and one-half years after the keel-laying ceremonies, the USS GEORGE C. MARSHALL (SSBN 654) sailed from her home shores to take station at sea.

In September, 1971 after completion of twenty (20) deterrent patrols, the USS GEORGE C. MARSHALL was ordered to Puget Sound Naval Shipyard, Bremerton, Washington to be overhauled and converted. During the following 18-month period, the MARSHALL was overhauled, refueled and converted to Poseidon weapons system. In addition, the MARSHALL was fitted out for MK 48 torpedo capabilities.

After conversion, USS GEORGE C. MARSHALL was assigned as an operational unit of Submarine Squadron SIXTEEN in Rota, Spain.



**USS GENERAL GEORGE C. MARSHALL
(SSBN 654)**



"Let the World not mistake our patience for weakness."


General George C. Marshall




SHIP'S INSIGNIA

SHIELD: The wavy blue and gold (yellow) field alludes to the oceans of the world and to the Navy. The red bend with its 5 silver (white) stars refers to George C. Marshall for whom the vessel is named. (The ancient coat of arms of Marshall was a red shield with a bend consisting of fusils. The fusils have been replaced by 5 silver stars (mullets) and on a red ground suggest the distinguishing flag of a General of the Army.)


CREST: The flaming trident issuing from the sea (waves) alludes to the class and type of the vessel, its missile armament and capability of firing such missiles from under water. It thus symbolizes "fire from the sea".

A small boat is visible on the horizon of a blue sea under a bright, hazy sky. A five-pointed star is mounted on the boat's mast.

"Eternal Father, strong to save,
Whose arm hath bound the restless wave,
Who biddest the mighty ocean deep
Its own appointed limits keep.
O hear us when we cry to thee
for those in peril on the sea."

A small boat is visible on the horizon of a blue sea. A five-pointed star is mounted on the boat's mast.

"Lord God our power ever more,
Whose arm doth reach the ocean floor,
Dive with our men beneath the sea;
Traverse the depths protectively.
O hear us when we pray, and keep
them safe from peril in the deep."

A small boat is visible on the horizon of a blue sea. A five-pointed star is mounted on the boat's mast.